

### Abstract

A voltage regulator with a switch to alternately couple and decouple an input terminal to an output terminal with a variable duty cycle and a filter disposed between the input terminal and the output terminal to provide a substantially DC voltage at the output terminal. A sampling circuit makes measurements of an electrical characteristic of the voltage regulator at discrete moments of time, such as just before the opening and closing of the switch. A feedback circuit is coupled to the sampling circuit and the switch, and is configured to use the measurements to control the duty cycle to maintain the DC voltage substantially constant. The feedback circuit uses the switch as the resistive element in order to measure the current passing through the voltage regulator.

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